

POINT OF VIEW

In these days of iMac, iPod, iPhone, iPad... Are we heading toward the world of iTissue?

Well, it has been a long road to transform the art of papermaking into the era of the computer-driven tissue world we live in today. Man and machine have come a long way together and have reached a very acceptable *modus vivendi*, having made life so much easier.

Guy Goldstein

When, many moons ago, I joined the paper industry in the late 1960s, computing was not an everyday topic of conversation. The only machines which were coming out and helping us were calculating machines – big, clumsy, with leds and a battery life of just a few days... But they still represented a breakthrough. Tissue in Europe was still in its infancy.

Just out of University with a PhD and a Chemical Engineering degree, I joined a small outfit part of the Beghin conglomerate at the time. I was assigned to board and liner manufacturing on two machines, one dating from 1908, the other much more modern, from 1928! Papermaking was an art; the Superintendents knew everything and did not want to hear from a "young" newcomer. After a serious look at how paper was made, I soon realized that we were not measuring anything and that introducing a simple machine would induce savings and better quality and controls. The "cheap" chemicals were measured in pales thrown into the pulper, the "expensive" ones in ladles poured into the machine chest; it was not difficult to decide what kind of machine was needed: scales to weigh the various ingredients. We immediately cut chemical costs by more than 50%, thus generating savings and boosting capacity, too, as well as reducing pollution. The ionic load decreased immediately, although at the time we were not sure exactly what had happened to boost productivity.

Later on, in the early '70s, the tissue industry really started up in Europe. The UK, close to the USA in terms of consumer behavior, was the first country to really develop the industry and was soon followed by the rest of continental Europe. The machines for tissuemaking were rather crude at the time, modified fourdriniers, soon to be endowed with non-fancy electrics. The machines for converting were as well coming out of the hand-driven era, and were by now being run by motors. Changing sizes or format was a challenge involving skilled technicians for many hours.

THEN, SLOWLY, A REVOLUTION TOOK PLACE: ELECTRONICS AND COMPUTING BECAME REASONABLY AFFORDABLE AND READILY AVAILABLE and were to revolutionize both manufacturing and converting. Also, the systems put into place were open, leaving possibilities to enter modifications. First came basic programming and small automats, then more integration followed, servo-motors, sophisticated electronics, memories enlarging and hardware slimming, reliability increasing, needing less TLC (tender-loving-care) and prices melting faster than the ice cap. How did it work? Well, specialists – artists – in papermaking tried to convey their knowledge inside the memory of the computer. It was fairly easy: the computer performs better repetitive actions, and does it faster.

Grade changes on tissue machines used to take a good hour or two of wasted production; today it's done on the run within minutes. Color changes used to be painful and costly: today, with the progress in chemistry and automation, it's done on the fly, avoiding off-color waste. Jumbo reel sizes off the winder went from a diameter of 1.20 meters to a convenient 3 meters today. Machine width became standardized, mostly at 2.8 meters or 5.6, except in South/Central America where it stood at 3.6 meters.

The machine still needs to be fed information by man and program writing takes some time. We are also entering a generation of smart computers that have cognitive functions: they can learn by themselves, comparing known data and extrapolating solutions, but still they are not human. A non-programmed solution cannot be executed, and this is an area where man will always be superior to the machine.

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THE ENERGY CONTROL AND BALANCE WHICH WAS DONE INTUITIVELY IS NOW THE SUBJECT OF RENEWED INTEREST. It was definitely an art playing with the vacuum pumps power to dewater the sheet after formation while trying to control the presses; today, a computer instructed by years of experience can turn on or off a vacuum pump and modify the press pressure to secure the "best" compromise in terms of product quality. Drying on the Yankee and using the hoods to attain the right softness or to save calories has been brought to perfection by the algorithms of applied mathematics. We have witnessed hood temperatures going from 120°C to 650°C while energy was being saved. Impingement speeds in the hoods have increased dramatically, and we learned that it was possible to obtain a tissue surface with tremendous softness while increasing strength, too.

This has been possible only by R&D and trial-and-error during some 50 years which man has graciously transferred to machine. The machine is able to do things faster but not yet better, and, in any case, only thanks to the fact that it was created by man and his work. I see this as a team effort, transferring knowledge acquired through great pain to a machine that only reacts faster.

Today, with progress having been accomplished, starting up a tissue business is like buying a suit. You walk into a shop, buy a machine(s) off the shelf, have some small alterations made to correct the size, press the on button and you're in business...

The only thing you really need is money.

WELL, IT'S NOT JUST THAT EASY YET, BUT WE ARE GETTING THERE! Man is still preponderant in decision-making and in pursuing a strategy which will lead to a win-win situation. Yet in these days where Internet seems to have taken over the world, nowhere will you find the recipes used to make tissue grades: this is still a very well kept secret by papermakers to ensure their survival and control over the tissue industry.

The name of the game is still concentration in order to bring products close to the marketplace, and while the machine helps, the decisions are always the privilege of man. It is a cooperation, not a competition, and certainly the pioneers in papermaking are still the gurus of our industry. A lot of functions can even now be voice-activated, like format changes for packaging equipment for example, which means you need to talk nicely to your machine in order to get what you want. I would not be surprised if all these computers were female... but then again I can hardly see anyone falling in love with a piece of hardware! A lot of people bring their computer home but very few divorces are linked to this.

Machines are now extremely sophisticated but so much easier to run. They somehow mimic human behavior, making actions obvious. A machine will never replace ingenuity and man still guides the tissue world by making everything possible. iTissue is not our future! •

If you have any questions you would like to place to Dr. Goldstein's attention, you can write to: guy.goldstein@perinijournal.com